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ART UNIT	PAPER NUMBER
2153	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/672,718	AHMED ET AL.	
	Examiner	Art Unit	
	La Juania N. Mouzon	2153	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 April 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *26-50,55 and 56* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *26-50, 55 and 56* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. This Office Action is in response to Applicant's Amendment filed 4/23/2008. Claims 26-50, 55 and 56 are pending. Claims 1-25 and 51-54 are canceled.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 26-50, 55, and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stone (US PGPub 2003/0036886) and Hickman et al. (US 6,523,036), and further in view of Adiga et al. (US 5,892,913).

5. In regards to claim 26 Stone discloses, a system and method for maintaining a high availability processing environment, said system comprising:

a. a network having a plurality of clusters **(fig. 12 (#20, #30, and #40) and ¶0026, teach a network having a plurality of clusters.)**

b. and a control server adapted to monitor an operational status of said communication link, said operational status of the communication link being that said communication link is operational or non-operational **(¶0078 and ¶0100, teaches the control server (Node Monitor) monitors the operational status of the communication link.)**.

6. Stone does not disclose each cluster of the network comprising a plurality of identical servers, each cluster of the network being directly connected to at least one other cluster of the network, wherein each pair of clusters directly connected to each other is characterized by each server in a first cluster of the pair of clusters being directly connected to at least one server in a second cluster of the pair of clusters via a communication link; said control server being directly linked to at least two servers in each cluster via a communication channel between the control server and the at least two servers in each cluster.

7. In the same field of endeavor Hickman et al. teach an architecture having a plurality of clusters each having identical servers **(Col. 2 line(s) 45-46)** for use with an Internet database.

8. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Stone monitoring and control engine for multi-tiered service-level management of distributed web-application servers with Hickman et

al. teaching as discussed above to allow for the capability of providing very high availability to prevent downtime that would impact the application.

9. Neither Stone nor Hickman et al. teach each cluster of the network being directly connected to at least one other cluster of the network, wherein each pair of clusters directly connected to each other is characterized by each server in a first cluster of the pair of clusters being directly connected to at least one server in a second cluster of the pair of clusters via a communication link; said control server being directly linked to at least two servers in each cluster via a communication channel between the control server and the at least two servers in each cluster.

10. In the same field of endeavor Adiga et al. teach an architecture having a plurality of clusters directly connected to each other with a control server directly connected to each server in the cluster **(fig. 6a and 6b, Col. 9 line(s) 64-67- Col. 10 line(s) 1-7)**.

11. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Stone's monitoring and control engine for multi-tiered service-level management of distributed web-application servers and Hickman et al. Internet database system with Adiga et al. because Stone and Adiga et al. both teach an architecture having plurality of clusters and monitoring communications with a control server (node monitor), it would have been obvious to one skilled in the art to program the architecture of Adiga et al. to program the substitute architecture with the functionality taught by Stone's to achieve the predictable result.

12. In regards to claim 27 Stone discloses, a global dataset that includes an identification of each communication link in the network, said global dataset being accessible to the control server; and a local dataset specific to each cluster of the plurality of clusters, said local dataset including an identification of each communication link in the network to which the servers of said each cluster is coupled for flow of data out of the cluster, said local dataset being accessible to the servers of said each cluster **(¶0057-¶0060, teaches the global dataset being on the service-level objectives (SLO) agent this is accessible to the control server. Also that the local dataset being on the service agents that is accessible to the servers of each cluster.).**

13. In regards to claim 28 Stone disclose, a method for maintaining a high availability processing environment, said method comprising:

c. Providing a network having a plurality of clusters **(fig. 12 (#20, #30, and #40) and ¶0026, teach a network having a plurality of clusters.)**

d. providing a control server adapted to monitor an operational status of said communication link, said operational status of the communication link being that said communication link is operational or non-operational, said control server being directly linked to at least one server in each cluster via a communication channel between the control server and the at least one server **(Fig. 12, teach the control server (Node Monitor) being directly connected to at least one server in each cluster. Likewise, ¶0078 and ¶0100, teaches the control**

server (Node Monitor) monitors the operational status of the communication link.); and

e. monitoring an operational status of a first communication link between a first server of the first cluster and a second server of the second cluster, said monitoring being performed b y the control server, said monitoring including sending a query signal to the first server, said query signal requesting the first server to send a response signal to the control server indicating the status of the first communication link, said operational status of the first communication link being that said first communication link is operational or non-operational **(¶0044, teaches that the node monitor is able to test links from other networks other than it's specific cluster to determine the operational status. Likewise, ¶0078, teach the node monitor testing the communication links by using the conventional method of pinging. Therefore, when using this method a reply is requested and returned.).**

14. Stone does not disclose each cluster of the network comprising a plurality of identical servers, each cluster of the network being directly connected to at least one other cluster of the network, wherein each pair of clusters directly connected to each other is characterized by each server in a first cluster of the pair of clusters being directly connected to at least one server in a second cluster of the pair of clusters via a communication link.

15. In the same field of endeavor Hickman et al. teach an architecture having a plurality of clusters each having identical servers **(Col. 2 line(s) 45-46)** for use with an Internet database.

16. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Stone monitoring and control engine for multi-tiered service-level management of distributed web-application servers with Hickman et al. teaching as discussed above to allow for the capability of providing very high availability to prevent downtime that would impact the application.

17. Neither Stone nor Hickman et al. teach each cluster of the network being directly connected to at least one other cluster of the network, wherein each pair of clusters directly connected to each other is characterized by each server in a first cluster of the pair of clusters being directly connected to at least one server in a second cluster of the pair of clusters via a communication link.

18. In the same field of endeavor Adiga et al. teach an architecture having a plurality of clusters directly connected to each other with a control server directly connected to each server in the cluster **(fig. 6a and 6b, Col. 9 line(s) 64-67- Col. 10 line(s) 1-7)**.

19. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Stone's monitoring and control engine for multi-tiered service-level management of distributed web-application servers and Hickman et al. Internet database system with Adiga et al. because Stone and Adiga et al. both teach an architecture having plurality of clusters and monitoring communications with a control server (node monitor), it would have been obvious to one skilled in the art to

program the architecture of Adiga et al. to program the substitute architecture with the functionality taught by Stone's to achieve the predictable result.

20. In regards to claim 29 Stone discloses, wherein the first server is adapted to respond to the query signal by sending a prompt signal over the first communication link to the second server, said prompt signal prompting the second server to send a return signal to the first server over the first communication link, said return signal or absence thereof being indicative of the operational status of the first communication link **(¶0039 line(s) 1-4, teaches that any element (a server, in this case) in the tier can perform any function of the tier's service components. Therefore monitoring of the communication links between each other would fall under one of those components.)**.

21. In regards to claim 30 Stone discloses, wherein the first cluster has a load balancer adapted to distribute data traffic uniformly among the servers comprised by the first cluster **(¶0039 line(s) 1-4, teach that a load balancer can be added to any element (server) in the tiers for distributing incoming traffic uniformly.)**, and wherein upon receiving the response signal from the first server such that the response signal indicates that the first communication link is non-operational, the control server is adapted to notify the load balancer that the first communication link is non-operational **(¶0045, teaches notification of the communication link non-operational status and rely status to the load balancer.)**.

22. In regards to claims 31 and 36 Stone discloses, wherein upon being notified that the first server or communication link is non-operational, the load balancer is adapted to fail over the first server **(¶0045 line(s) 4-9, teaches that the load balancer stops sending information to the first server)**.

23. In regards to claim 32 Stone discloses, wherein upon receiving the response signal from the first server such that the response signal indicates that the first communication link is non-operational, the control server is adapted to inform a service node in the first cluster that the first communication link is non-operational **(¶0045 - ¶0046)**.

24. In regards to claims 33 and 38 Stone discloses, wherein upon being informed that the first server or communication link is non-operational, the service node is adapted to make a determination of a cause of the first server being non-operational **(¶0045)**.

25. In regards to claims 34 and 39 Stone discloses, wherein upon making said determination of said cause the service node is adapted to facilitate making the first server or communication link operational **(¶0045)**.

26. In regards to claim 35 Stone discloses, wherein the first cluster has a load balancer adapted to distribute data traffic uniformly among the servers comprised by the

first cluster **(¶0039 line(s) 1-4, teach that a load balancer can be added to any element (server) in the tiers for distributing incoming traffic uniformly.)**, and wherein upon not receiving the response signal from the first server within a predetermined period of time after sending the query signal to the first server **(¶0078, teaches the control server (Node Monitor) not receiving the signal within a predetermined period of time and the operational status of the first server.)**, the control server is adapted make a determination that the first server is non-operational and to notify the load balancer that the first server is non-operational **(¶0044, teaches the notification, by the control server, of the load balancer of the non-operation status.)**.

27. In regards to claim 37 Stone discloses, wherein upon not receiving the response signal from the first server or communication link within a predetermined period of time after sending the query signal to the first server **(¶0078)**, the control server **(Fig. 2 & 12 #28)** is adapted to inform a service node **(Fig. 2 #27 and Fig. 12 # 97)** in the first cluster **(Fig. 2 & 12 #20)** that the first server is non-operational **(¶0045)**.

28. In regards to claim 40 neither Stone nor Adiga et al. teach each cluster of the plurality of clusters has a load balancer that is specific to each cluster and is independent of the load balancer of each other cluster, and wherein the load balancer of each cluster is adapted to distribute data traffic uniformly among the servers comprised by each cluster.

29. In the same field of endeavor Hickman et al. teach each cluster of the plurality of clusters has a load balancer that is specific to each cluster and is independent of the load balancer of each other cluster, and wherein the load balancer of each cluster is adapted to distribute data traffic uniformly among the servers comprised by each cluster **(Fig. 2 #44 and Col. 8 line(s) 51-56)**.

30. Therefore, it would have been obvious to one of the ordinary skill in the art at the time the invention was made to modify Stone's monitoring and control engine for multi-tiered service-level management of distributed web-application servers and system and method for datastreams employing shared loop architecture multimedia subsystem clusters with Hickman et al. teaching as discussed above to have each cluster have independent load balancers for balancing across the plurality of nodes.

31. In regards to claim 41 Stone discloses, wherein the control server is adapted to receive a message from a first server of the first cluster or from a load balancer of the first cluster, said message indicating that an entity is non-operational, said entity being selected from the group consisting of a server of the first cluster and a communication link between the first server of the first cluster and a second server of the second cluster **(¶0039 line(s) 1-4, teaches that any element (a server or load balancer, in this case) in the tier can perform any function of the tier's service components. Therefore the first server or load balancer of the first cluster can notify the control server that there is an entity is non-operational)**.

32. In regards to claim 42 Stone discloses, wherein upon receiving said message the control server is adapted to inform a service node of the first cluster that the entity is non-operational **(¶0045-¶0046)**.

33. In regards to claim 43 Stone discloses, wherein the control server is directly linked to a first server of the first cluster and is not directly linked to a second server of the first cluster, wherein the first server is directly connected to the second server, and wherein the control server is adapted to monitor an operational status of the second server via direct communication with the first server coupled with direct communication between the first server and the second server, said operational status of the second server being that said second server is operational or non-operational **(Fig. 12, teaches the connection of the control server being connected to the first server of the first cluster and is not directly linked to a second server of the first cluster, but indirectly connected through the first server in the first cluster. This is taught because the definition of a cluster is a group of servers working together as one, this being said each server in the cluster is at least connected to one other server. As shown in Fig 12, if the communication link between the control server and the second server in the first cluster is lost then the second server of the first cluster is indirectly connected to the control server through the first server of the first cluster.)**.

34. In regards to claim 44 Stone discloses, wherein at least one cluster of the plurality of clusters does not have a load balancer adapted to distribute data traffic uniformly among the servers comprised by the first cluster **(Fig. 12, displays whereas at least one cluster of a plurality of clusters does not have a load balancer cluster.)**.

35. In regards to claim 45 Stone discloses, wherein the plurality of clusters includes a web cluster of web servers **(¶0029 line(s) 2-3)**,

f. an application cluster of application servers **(¶0030 line(s) 1-2)**,

g. and a database cluster of database servers **(¶0031 line(s) 1-3)**,

h. the web cluster being directly connected to the application cluster, the application cluster being directly connected to the database cluster, the web cluster adapted to communicate with the database cluster by way of the application cluster functioning as an intermediary cluster between the web cluster and the database cluster **(Fig 12)**.

36. In regards to claim 47 Stone discloses, wherein the web cluster has a load balancer adapted to distribute data traffic uniformly among the web servers comprised by the web cluster **(¶0039 line(s) 1-4, teach that a load balancer can be added to any element (server) in the tiers for distributing incoming traffic uniformly.)**,

i. wherein the application cluster has a load balancer adapted to distribute data traffic uniformly among the application servers comprised by the application

cluster **(¶0039 line(s) 1-4, teach that a load balancer can be added to any element (server) in the tiers for distributing incoming traffic uniformly.)**

j. wherein the database cluster does not have a load balancer adapted to distribute data traffic uniformly among the database servers comprised by the database cluster **(Fig. 12, does not show a load balancer on the database cluster.).**

37. In regards to claim 48 Stone disclose, wherein the plurality of clusters includes a web cluster of web servers **(¶0029 line(s) 2-3)** and a database cluster of database servers **(¶0031 line(s) 1-3)**, the web cluster **(Fig. 12 #20)** being directly connected to the database cluster **(Fig. 12 #40)**, the web cluster **(Fig. 12 #20)** adapted to directly communicate with the database cluster **(Fig. 12 #40)**.

38. In regards to claim 49 Stone discloses, wherein the web cluster has a load balancer adapted to distribute data traffic uniformly among the web servers comprised by the web cluster, and wherein the database cluster has a load balancer adapted to distribute data traffic uniformly among the database servers comprised by the database cluster **(¶0039 line(s) 1-4, teach that a load balancer can be added to any element (server) in the tiers for distributing incoming traffic uniformly.)**.

39. In regards to claim 50 Stone discloses, wherein the web cluster has a load balancer adapted to distribute data traffic uniformly among the web servers comprised

by the web cluster **(¶0039 line(s) 1-4, teach that a load balancer can be added to any element (server) in the tiers for distributing incoming traffic uniformly.)**, and wherein the database cluster does not have a load balancer adapted to distribute data traffic uniformly among the database servers comprised by the database cluster **(Fig. 12, does not show a load balancer on the database cluster.)**.

40. In regards to claim 55 Stone discloses, wherein the control server is the only control server adapted to monitor the operational status of said communication link and is the only control server that is directly linked to at the least two servers in each cluster via the communication channel between the control server and the at least two servers in each cluster **(¶0078 and ¶0100, teaches the control server (Node Monitor) monitors the operational status of the communication link. Since both the node monitor and service agent can monitor the status, it is obvious to state that if the node monitor(s) either didn't exist or fails then the service agent would be directly connected to at least two servers in each cluster, as shown in Fig. 12.)**.

41. In regards to claim 56 neither Stone nor Adiga et al. teach, wherein the plurality of identical servers in each cluster consists of all identical servers in each cluster, and wherein the at least two servers in each cluster consists of the plurality of identical servers in each cluster.

42. In the same field of endeavor Hickman et al. teach an architecture having a plurality of clusters each server in the cluster being identical **(Col. 2 line(s) 45-46)** for use with an Internet database.

43. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Stone monitoring and control engine for multi-tiered service-level management of distributed web-application servers and Adiga et al. system and method for datastreams employing shared loop architecture multimedia subsystem clusters with Hickman et al. teaching as discussed above to allow for the capability of providing very high availability to prevent downtime that would impact the application.

Response to Arguments

44. Applicant's arguments filed 4/23/2008 have been fully considered but they are not persuasive for claim 28.

45. In regards to claim 28 applicant agues, "monitoring an operational status of a first communication link between a first server of the first cluster and a second server of the second cluster, said monitoring being performed b y the control server, said monitoring including sending a query signal to the first server, said query signal requesting the first server to send a response signal to the control server indicating the status of the first communication link, said operational status of the first communication link being that said first communication link is operational or non-operational (pg. 17-18, remarks)" The Examiner asserts that Stone does teach the control server (node monitor) is able to

monitor the operational status of a communication link between servers in a different cluster **(¶0044 and ¶0078)** since the control server (node monitor) is directly connected to at least one server in each cluster **(fig. 12)**, as also stated in claim 28. Likewise, as pointed out by the applicant (pg. 18, remarks) Stone defines the monitoring of the node monitor **(¶0044)** by, "Node monitor 28 monitors the nodes for web servers 21, 22, 23, and can also monitor **any sub-networks associated with these nodes**" (emphasis added). Therefore due to the connection of at least one server in each cluster to that node monitor, each cluster would be classified as sub-network associated with the first cluster.

46. Applicant's arguments with respect to claims 26-50, 55 and 56 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to La Juania N. Mouzon whose telephone number is 571-270-3045. The examiner can normally be reached on Monday - Friday 8:00-5:00, 1st Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenton Burgess can be reached on 571-272-3949. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/THUHA T. NGUYEN/
Primary Examiner, Art Unit 2153

LNM